Angelus

OWNERS MANUAL

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MANUAL ORGANIZATION

Assuming you are anxious to start listening to music through your new Angelus speakers right away, this manual has been organized to help you get your system up and running quickly (Basic Setup), and then perform some of the fine-tuning procedures that are necessary for optimum performance (Setup Detail). In order to avoid unnecessary detail for those of you who are replacing the speakers in your present system, information on choosing an optimum location for the Angelus is left out of the Basic Setup section, and is covered in depth in Setup Detail. If you are setting up your system for the first time or in a new location, it would be wise if you read this section before setting up. The section on Fine Points treats a variety of topics, such as amplifiers, speaker wire, and a few other goodies. Should you have any questions, call your dealer or drop us a note - we're here to help.

spica

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INTRODUCTION

Thanks for choosing the SPICA Angelus speaker system. The Angelus is among the most sophisticated dynamic speakers available, featuring exceptional spatial resolution, neutral tonal balance, and a unique and attractive shape. The Angelus is dedicated to the memory of Richard C. Heyser, inventor of Time Delay Spectrometry. It is upon the fruits of his work that our own work rests.

Check the packing box(es) to make sure that you received the following materials.

> 1 Angelus speaker (the box will feel rather light if it is missing)
> 1 bag of rubber feet, spikes, and nuts (not the edible kind)
> 1 product registration card
> This manual.

Also check the serial numbers on both of the boxes. The numbers should be the same, with one ending in 'A' and the other in 'B'. Angeluses (Angeli ?!?) are born as identical twins, and we wouldn't want them to get mixed up.

Notify your dealer immediately if any of the above is amiss.

Some of the 'tools' you will need for setup are:

> MEASURING TAPE	(for physical placement)
> WRENCH, 7/16 INCH or ADJUSTABLE	(for spike adjustments)
> A FRIEND	(things work better with friends around)
> WIRE STRIPPERS or RAZOR BLADE	(optional, for speaker wire prep)

You may be curious as to why the enclosure is shaped the way it is. It is generally a consequence of the baffle board slope (the baffle is the surface that the woofer and tweeter are mounted on), and the baffle board shape. The slope is to synchronise the arrival of the sound from the woofer and tweeter to your ears (taking all sorts of things into consideration). The large surface area above the tweeter helps it operate better down to lower frequencies, and the small area around the woofer lets it operate more optimally up to higher frequencies. All of this contributes to the seamless merging of their combined outputs, and improves the power capacity of the tweeter (really!). We hope you find the Angelus as functionally elegant as we do.

Although parts of the setup procedure are somewhat technical, we have made every effort to present them as simply as possible. Please read and follow the instructions carefully.

* - *

BASIC SETUP

Getting it Up

<> Turn off your power amplifier or receiver.

<> Move each Angelus near to where they will be set up. Place the unit whose serial number ends with the letter 'A' on the left side of your system (as you face it). Carefully lay the Angelus down on its back.

<> Find the parts bag. To help you decide whether to use the spikes or the rubber feet, read the paragraph on the next page with the heading "Eight Holes in Your Favorite Rug". If you choose the spikes, put one nut on each spike, thread each spike the same amount (a few turns) into each of the four recepticles on the bottom of the enclosure. Don't tighten the nuts just yet.

<> Stand the Angelus back up, and place it where you wish it to be.

<> Most specialty speaker wires come already prepared for connection. If you are using more conventional wire, then, using wire strippers or a razor blade, strip 3/4" of the insulation from the wire, twist the strands of the wire together tightly, and form a hook shape on the exposed wire ends.

<> Loosen the red plastic insulating knob on the back panel of the Angelus by turning it counter-clockwise a few turns. Bring the "+" lead of the speaker wire up to the red post and place it around the post so that the hook wraps clockwise around the inside of the post. Turn the knob clockwise as tight as you can by hand. You may use a 1/2 inch wrench to tighten the knob, but don't try to torque them too tight - firmly snug is just right.

<> Repeat this process for the black "-" binding post, and then again for the other Angelus.

<> DO NOT ALLOW BARE WIRE FROM ONE INPUT TO TOUCH THE OTHER INPUT OR ITS BARE WIRE LEAD. Serious damage to your amplifier will result if you do.

<> Follow the amplifier manufacturer's instructions regarding speaker wire connection to the amplifier, making sure that the "+" output of each channel is connected to the red input on each Angelus.

<> Orient each speaker so that it points directly at your favorite listening area. This is sometimes referred to as "toeing them in". Avoid placing the speakers on opposite sides of the room facing each other, if possible.

<> When powering up your system, make it a habit to always turn on your receiver or amplifier last. When shutting the system off, turn the volume control down all the way and turn the amplifier off first. This practice will avoid possible damage to the Angelus caused by the "pops" and "clicks" that some pieces of audio equipment put out when turned on or off.

Breaking it In

Every mechanico-electrical device has a 'break-in' period, during which the moving parts become more supple and the electrical parts become more stable. For the Angelus, the most significant portion of this takes place over the first ten hours of use. During this period, you will notice that the sound becomes sweeter, more natural, and more spacious. One way of breaking them in is to leave your system on while you are, for instance, away at work for the day, using an FM radio station as program material, with the system playing at a moderate volume. When you return in the evening, most of the break-in will be completed.

Eight Holes in Your Favorite Rug

Some folks live in really nice houses, with Persian rugs and oak tongue-and-groove covering up the plumbing and foundation (not here in Santa Fe, where mud walls, dirt floors, and tin roofs are the norm). If you have a floor that you can't abuse slightly, then you need to know that, yes, it is true. The spikes will put holes in your rug or carpet, especially with a 65 pound speaker on top of them. They will also put significant indentations in your oak parquet flooring. We furnish them because they improve the coupling of the speaker to the floor (which improves the sound). If you simply can't have the holes, then put the little rubber feet, which you will find in the same bag as the spikes we in, over the holes where the spikes belong. Be sure to cover the holes so the rubber feet will seal the hole.

Your system is now ready for use. Some aspects of its performance can be fine-tuned, however, and we highly recommend that you take this opportunity to read the rest of this manual, so that you might gain the maximum sonic benefit that the Angelus have to offer.

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SETUP DETAIL

Why Bother?

Unlike the other components in your audio system, how well the speakers perform is dependent in part upon their placement, both within the room and with respect to your optimum listening location. In normal use, sometimes you will be sitting listening to the music, virtually participating in every nuance, while at other times you will be using the system more for background music, not giving it your complete attention. These two circumstances relate directly to the two placement considerations mentioned. Proper placement of the speakers within your room will achieve the most natural and consistent tonal balance throughout the room. Proper placement of the speakers with respect to your chosen listening seat will achieve the most lifelike stereo imaging. The goal of proper speaker placement is to optimize the performance of each of these parameters. We recommend that you favor those guidelines that correspond to the conditions in which you will be using the speakers the most.

Obviously, there will be other considerations to take into account in your setup, such as aesthetics, maximizing the available space, and the opinions and feelings of others.... So as to avoid sticking our nose where it doesn't belong, we will concentrate our recommendations on obtaining the best performance from your system.

Placement Within the Room

The methodology behind room placement is basically simple geometry - finding the line between two points, measuring how long the line is, comparing it to the length of other related lines, and so on. These lines, or paths as we will call them, all originate at one of the speakers, and eventually arrive at your ears, that is, your listening seat. One of them is a direct path from the speaker to your ears, while the others are reflective paths, bouncing off of the floor or walls before arriving at your ears. We will be using these terms in the explanations that follow.

The direct path primarily affects the imaging abilities of your system, while the reflective paths affect the tonal balance, especially in the bass and lower midrange. There are 4 major reflective paths in any room, off of the following surfaces:

> Floor. This one is normally the shortest reflective path, and hence causes the most problems. Carpeting helps a lot.
> The wall behind the speakers.
> The nearest side wall.
> The wall behind the listening position.

The ceiling is not as much of a problem, because our hearing is basically oriented to horizontal perception. A low ceiling would definitely be a candidate for the list, though.

Generally speaking, the Angelus should be at least one foot away from the rear wall, and as far as possible from the side walls. Most importantly, the reflective paths off of each of these surfaces should be as unequal as possible. The smoothest possible tonal balance throughout the room is achieved when this can be done.

Equally important is that the speakers be placed symmetrically within your room. For example, if one speaker is 3 feet away from its side wall, then the other speaker should also be placed 3 feet away from the side wall nearest it. Figure 1 on the next page shows an example of symmetrical placement with unequal path lengths, viewed from above.

One situation to avoid is placing a speaker in a corner of the room at an equal distance from the side and rear walls. This will make your system sound 'tubby' or bass-heavy, and not very spacious at all. The more 'out in the open' the speaker placement is, the more open and spacious the sound will be.

Another one to avoid is when the distance from your listening position to the rear wall is the same as the distance from the speakers to the wall behind them.

This problem is related to what are called 'standing waves'. Most rooms are rectangular in shape, with three sets of parallel surfaces. Imagine, if you will, three strings, each stretched between the opposing surfaces in your room, and each having the same amount of tension applied. If you were to pluck these strings, they would produce sound at three different tones, with the lowest tone being produced by the longest string. The tones that correspond to the dimensions of your room are **supported** by the surfaces, just like the strings. These tones will have a tendency to be accentuated in your room, compared to others. Furthermore, if one of the reflective paths is the same length as one of your room's dimensions, that tone is accentuated even more. Hence the importance of having varied path lengths in your setup geometry.

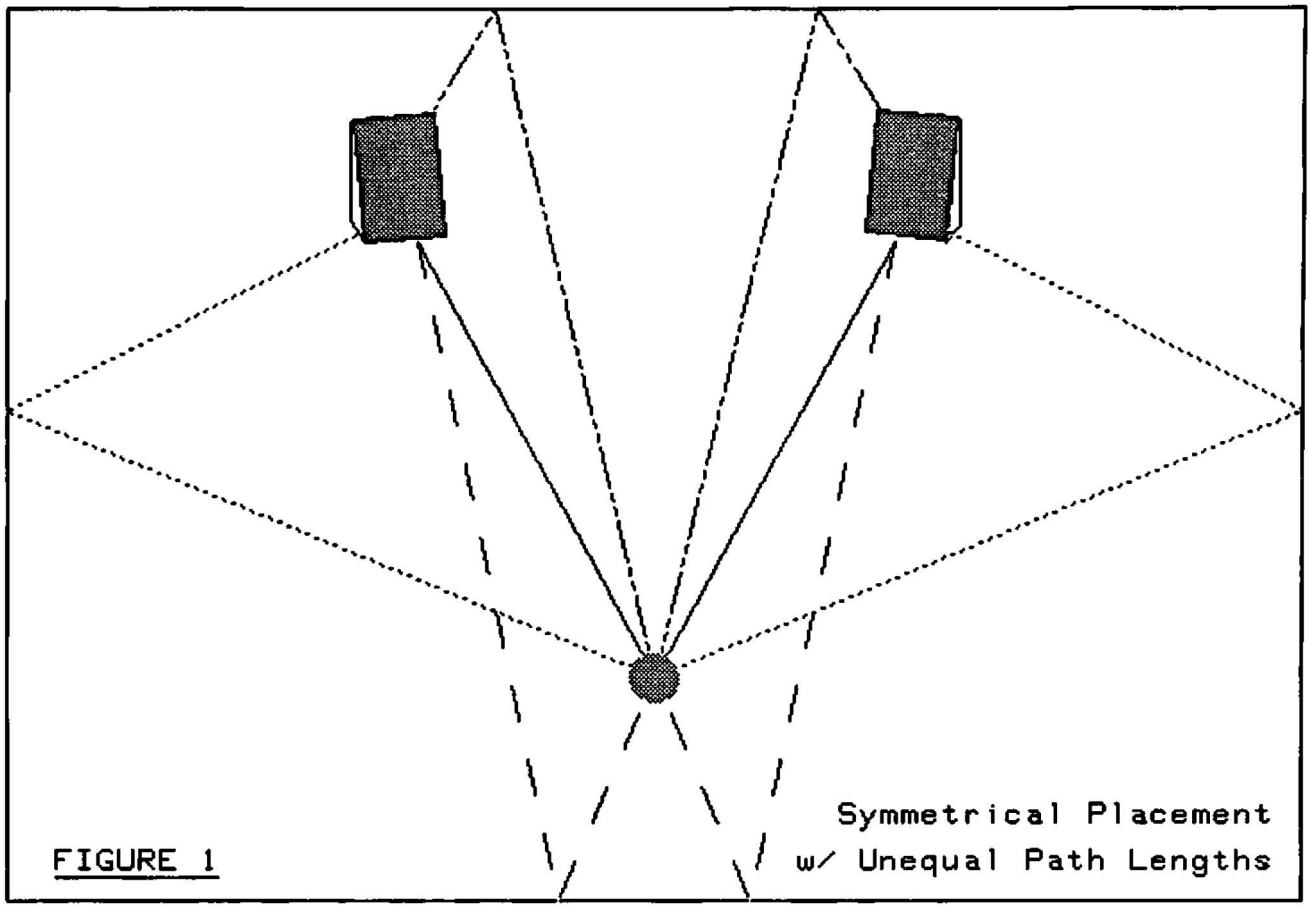

FIGURE 1

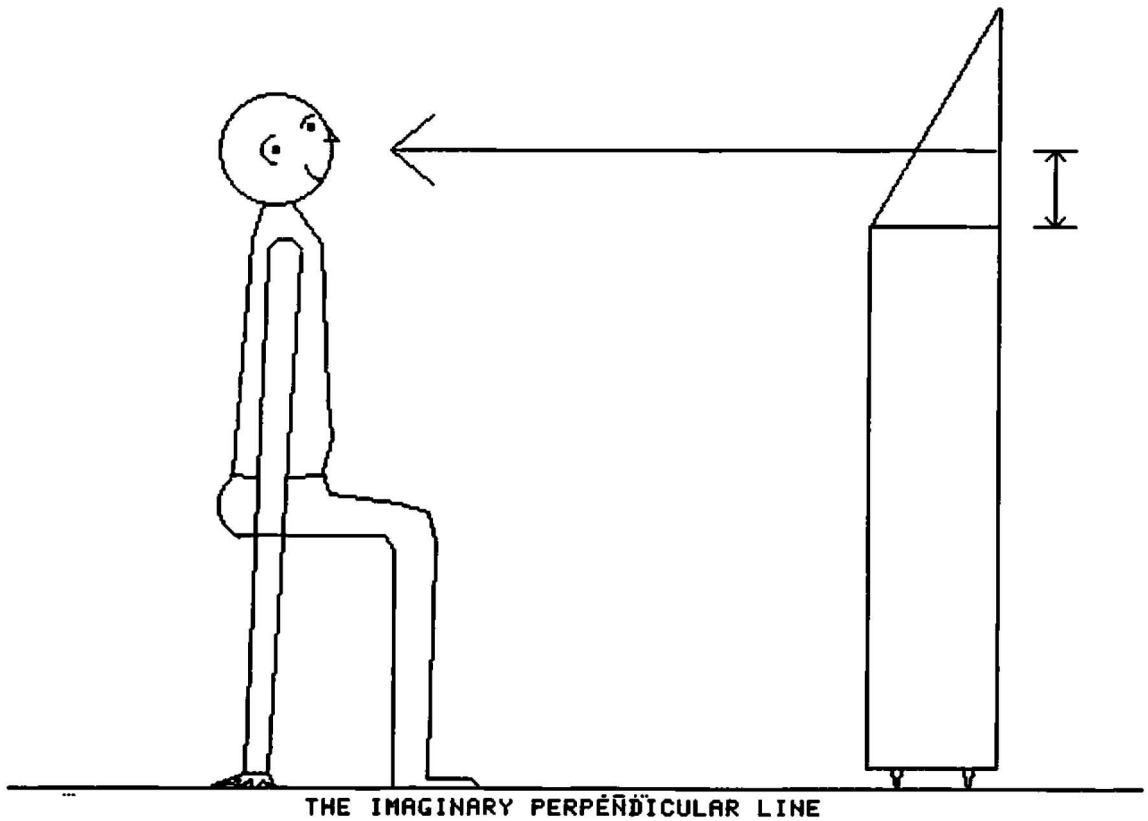

FIGURE 2 THE IMAGINARY PERPENDICULAR LINE

A common question is whether the speakers should be set up along a long or short wall in the room. In smaller rooms, where the longest distance between opposing walls is 14 feet or less, setup along the long wall will probably give the best results. In larger rooms, setup along a short wall is preferable.

Placement Relative to the Listening Position

In phase-coherent systems (as in life in general), TIMING IS OF THE ESSENCE. And in matters pertaining to sound, time translates directly into distance, because sound moves through air at a given speed. In the introduction to this section, we hinted at the fact that, while smooth tonal balance can be achieved over a wide range in your room, the magic of nearly holographic imaging can only occur at one point in space. In order to reproduce a stable and lifelike stereo image with the Angelus, two things are necessary:

1> The distance from each Angelus to your listening position should be the same.
2> The tilt of each speaker should be the same, and adjusted according to the instructions that follow.

For convenience in explanation, we will refer to your listening position as a chair.

<> Find the point at ear height at the center of your chair, and mark it with a piece of masking tape.
<> Using a tape measure, find the distance from this point to the floor, and jot the figure down somewhere.
<> Measure the distance from one Angelus to your mark.
<> Now measure the distance to the other Angelus, and move it toward or away from you until it is the same distance as the first Angelus.

As for the height and tilt, take a peek at Figure 2. It shows a line drawn perpendicular to the back of the Angelus from the point that is halfway between the woofer and the tweeter. The object is to have this line point right at your ears when seated in your chair. Now, there is no such line on the Angelus cabinet, and you would have thought we were nuts if we had put one there. So, instead, we will use the top of the pedestal as our sight-line, which happens to be parallel to this line, and apply a 'fudge-factor' to make it work.

If you are using the Angelus without spikes, you cannot make this adjustment; so sorry. The magic line for you is 36 inches off the floor. For an Angelus with spikes, this line is 37 inches off the floor. If the floor-to-ear-height measurement you made just a minute ago was 37 inches (give or take a half inch), you may skip the next four instructions. The rest of us will be adjusting the tilt of the Angelus by raising or lowering the spikes. For ear-heights below 37", you will lower both front spikes; for heights above 37", lower both rear spikes.

<> Using your measuring tape, find the point on your chair that is 7 inches **below** the ear-height mark, and mark it with a piece of tape.
<> Sighting along the top edge of the pedestal, adjust the tilt of the speaker, so that the point just marked on your chair lines up directly the ledge.
<> Repeat this procedure for the other Angelus.

Now, unless you floor is absolutely perfectly flat, you will need to make slight adjustments to the spikes so that the Angelus doesn't wobble on them. Push back and forth diagonally (and gently) on the top of the speaker, and you'll see what I mean. Adjust one or other of the spikes that are lined up in the direction in which the wobble happens, until it stops.

Now you can lock the spikes in place. Take your trusty 7/16" wrench and, while securing the spike with one hand so it doesn't turn, tighten the lock nut up against the enclosure. Snug is just fine, and you'll need to do all four.

* - *

FINE POINTS

If you have followed the setup instructions in order, your setup is now complete. Spend some time sitting and listening to a variety of music through your new system. Notice how different the quality of each recording is, how easy it is to pick out individual voices and instruments even in complex material, how warm and rich the sound is, and how totally unfatiguing the Angeli are to listen through. With well recorded music, the magic of the Angelus becomes evident in its ability to reproduce warm, natural tonal balance while at the same time presenting a realistic image of the space that the music was recorded in.

If you don't mind a little 'tech talk', here's some general advice on getting the most out of your system, either now or in the future.

Amplifiers

The job of the power amplifier, whether it is a separate component or part of a receiver, is basically twofold. First, to make the signal coming from your source (record, CD, whatever) strong enough (and without distortions of any kind) to cause sound to come out of the speakers. Second, it must be able to overcome the constantly changing electrical conditions (called 'impedance' or 'load') that a speaker presents to an amplifier. Although it is beyond the scope of this manual to discuss why, it is a fact that some amplifiers do this better than others. Here are some things to look for when comparing power amplifiers and receivers:

> High instantaneous current capacity.
> Wide full power bandwidth.
> Constant damping factor over the widest possible frequency range.
> Low transient intermodulation distortion (TIM). This is much more important than the usually quoted harmonic distortion.

The Angelus presents quite an easy load for an amplifier to drive; the minimum impedance is 5.8 ohms, and occurs at 8.5 kiloHertz.

How much power you will need depends on how loud you like to play your music. For soft to normal volume levels, 20 to 50 watts will be just fine. If you really like to 'wick it up' sometimes, then the more power available, the better. Most damage to speakers happens because of insufficient power being available for the volume level being demanded. With percussive music, it is not uncommon that the peak power required will exceed the average power by a factor of ten or more! To illustrate the point, let's say your 50 watt amplifier is cruising along delivering 7 watts average to the Angelus. Along comes a passage

where the drummer smacks a cymbal and kicks his bass drum at the same time that everyone else in the band is coming down hard on a note. 70 watts would be needed to reproduce it cleanly, but only 50 are there. The result is something that not only sounds grundgy, but it also builds up heat in the woofer and tweeter of the Angelus. If that happens a few times a minute, well, everything starts sounding fuzzy, and your speakers need repairing. The moral is: have more power than you need to play as loud as you want to, and use it with discretion.

Generally speaking, separate components tend to perform better than integrated receivers. There are some wonderful exceptions to this rule, however; consult your dealer for further information.

Speaker Wire

Although their cost may seem high, quality speaker wire makes a significant contribution to the total performance of your system, especially if the distance between power amplifier and speaker is great. The usual 'lamp cord' will tend to make the system sound dull and lifeless in the trebles, mushy in the bass, and generally hamper the amplifier's ability to control the speaker. There are quite a number of excellent speaker wires available, with more appearing all the time. Wires from companies such as Straight Wire, Kimber Cable, and others, provide excellent performance at reasonable cost. Ask your dealer for advice.

> Use the shortest length of wire possible between amp and speakers.
> For systems set up for careful listening, both speaker wires should be the same length. Unequal length wires can create subtle (or not-so-subtle, depending on your attentiveness) imbalances in tonal 'colors' and dynamics between the two speakers.

How Wide Thou Art

How far apart the Angeli are relative to how far away from them you are sitting affects the imaging performance of your system. The wider they are apart, the wider the 'soundstage' will be. The closer they are, the better will be the resolution of imaging detail within the soundstage, i.e. between the speakers. The goal is to find the balance point between these two imaging characteristics that suits your tastes.

A good place to start is to make the distance between the speakers equal to two-thirds of the distance from your listening position to the speakers, and play around with spreading them apart and bringing them closer together until you find what you like. Remember also that moving the speakers alters the pattern of reflective paths discussed in the Setup Detail section, so tonal balance may be affected somewhat....

System Polarity

Suppose you were standing in front of a mirror that turned everything reflected in it upside down. All the features of the image would be there, but they would be inverted. This is a visual analogy of what is called Polarity. The audio industry has not established any polarity standards, so some pieces of equipment invert the signal as it passes through them, and others do not. It is argued by some that, since the inversion status of each record, CD, etc. is unknown, proper system polarity is unimportant. For those of you who feel that it is, here's how to make your system positive polarity.

In order to determine the polarity of your system, you must find out which pieces in your system invert the signal, and which ones do not. This information is sometimes given in owners manuals. Otherwise, you can contact your dealer or the manufacturer, or look in AUDIO Magazine's Annual Equipment Directory (in each year's October issue), which lists the inversion status of some units. Once you have this information, its easy to determine the polarity of your system and correct it, if necessary, by reversing the connections of the speaker wires to each Angelus.

Make a list of numbers that correspond to each piece of equipment in your system, including everything from the source to the speaker outputs of your receiver or power amplifier. If the unit inverts, give it a value of 1; if it does not, give it a value of 0. For VCRs and CD players, it is probably safe to assume that they do not invert. Now add up all the numbers. If the result is an even number or 0, your system is positive polarity, and no change is required. If the result is an odd number, you should reverse the connections to each Angelus at its input terminals.

On Tone Controls, Loudness Switches, and Rumble Filters

The so-called 'loudness' control found on receivers (and some preamps) is intended to make the perceived tonal balance of music sound more natural when it is played at low volume levels. When engaged, the loudness control boosts the extreme bass and trebles. When playing your system at medium to high volume levels, this can gobble up a lot of amplifier power and place unnecessary demands on the excursion of the Angelus' woofer, so MAKE SURE THE LOUDNESS CONTROL IS SWITCHED OFF.

If you are:
- > playing a record that is badly warped,
- > playing your system VERY loud with a record as the source, or
- > boosting the bass a bunch with your bass tone control,

then you should consider engaging the rumble filter on your preamp/ receiver if it has one. Otherwise, it should be left off.

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TECHNICAL SPECIFICATIONS

System Type	: Sealed box
Enclosure Volume	: 2.5 $ft.^3$
System Resonance / Q	: 34 Hz, Q_t= .51
Frequency Response (-3dB)	: 45 Hz - 17.5 kHz
Woofer	: 8" plastic cone
Tweeter	: 1" impregnated cloth dome
Woofer Crossover	: 4th order Bessel response
Tweeter Crossover	: Computer derived, approx. 1st order response
Crossover Frequency	: 3.4 kHz (-6dB)
Input Impedance	: 8 ohms nominal, minimum 5.8 ohms @ 8.5 kHz
Polarity	: Both drivers positive
Sensitivity	: 87dB @ 1 watt, 1 meter
Recommended Power	: 20 - 200 watts
Size in inches(cm)	: 21(53.3)W x 46(116.8)H x 10.25(26)D
Net Weight in lbs(kg)	: 65(29.5) each

WARRANTY

When purchased from an authorized SPICA dealer, SPICA warranties the Angelus to be free from mechanical defects for five (5) years from the date of purchase. This warranty is valid for the original purchaser only. Your sales receipt is your proof of purchase. Items covered under warranty will be either repaired or replaced at SPICAs option. This warranty excludes damage caused by user abuse, carelessness, and fault conditions in associated equipment. SPICA reserves the right to make final determination of warranty coverage. SPICA makes no other warranties, either expressed or implied.